ABSTRACT

Non-invasive wearable systems for continuous measurement of blood glucose concentrations help diabetics maintain best awareness and control. A wearable article such as a wristwatch includes elements integrated therewith to provide for biometric measurements. Specifically, both optical and acoustic transducers are arranged within an article such that they are coupled to tissue in a manner which permits blood analytes measurements to be made. In best versions, a quantum cascade laser is arranged with crystalline acoustic detectors in a photoacoustic effect measurement scheme. Laser pulses stimulate special vibrational states of glucose molecules to produce an acoustic return signal to be received at a piezoelectric detector. A wristwatch case may include a back member which supports arrangements and coupling between the back of the watch, elements contained therein, and tissue in contact with the device.